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relative values on a graded scale have been employed with varying degrees of success. The tendency is toward a more and more critical evaluation of marking systems in terms of the results obtained from their use. One of the most critical studies of this character is published in a recent educational monograph[1] of Harvard University. The purpose of the study is defined in the opening paragraph.

> This study represents an investigation into the distribution of the marks of the College Entrance Examination Board for the years 1902 to 1920 inclusive. It was made in order to discover if there were any grounds for the strong criticism of the college-entrance examinations by New England educators, more especially secondary-school principals and teachers. It is published at this time because the Board in its Twentieth Annual Report recognized the existence of sudden and violent fluctuations, from year to year in the results of the examinations, in many subjects, and voted to employ expert assistance to aid in determining the specific causes [p. 3].

The study covers the subjects of English readings, elementary French, elementary algebra, and plane geometry. These subjects were selected because they were offered by most of the candidates. In the arrangement of the marks the class intervals employed were 90–100, 75–89, 60–74, 50–59, and 0–49. The results show that most of the distributions are bimodal and that most of them are skewed negatively, or toward the lower end of the distribution. A comparison is made between the ratings of the recommended candidates and of those who were not recommended. Apparently, the recommended or superior individuals are no more consistently rated than the members of the rejected group. A number of graphs of selected distributions are presented, together with a discussion of the evidence upon which the investigator based his expectancy that the distributions would conform to the normal curve. A careful analysis of the effect of reading methods on the distribution is presented. The author's conclusions embody an interpretation of the data secured through the study.

The study presents a point of view and a basis for checking the reliability of a distribution of examination marks that merit careful consideration. It will be found helpful by all students of educational marking systems in determining what form of distribution is best adapted to meet a particular situation.

H. W. NUTT

Reorganized mathematics.—To meet the widely recognized need for a reorganization of high-school mathematics, we are being well-nigh flooded with a stream of new textbooks. One of the latest of these publications[2] is worthy of especial attention.

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[1] *The Marking System of the College Entrance Examination Board.* "Harvard Monographs in Education," Series 1, No. 2. Cambridge, Massachussetts: Harvard University, 1921. Pp. 16.

[2] JOHN B. HAMILTON and HERBERT E. BUCHANAN, *The Elements of High School Mathematics.* Chicago: Scott, Foresman & Co., 1921. Pp. 297.

The book, as its title-page indicates, comprises arithmetic, practical geometry, and algebra. While it is called a book on "mixed mathematics," unlike most recent texts, it does not include any trigonometric material. The mathematics is mixed only so far as the whole course is concerned, the different branches not being mixed in treatment. "The arithmetic, geometry, and algebra are treated each by its own specific technic and methods." This may facilitate in some ways the teachableness of the text, but in places it means a loss of correlation, save for the teacher who is skilful enough to take advantage of the fact that the beginnings of experimental geometry and algebra and later phases of arithmetic are developed so closely together. On the other hand, such related phases of a topic are given as seem essential to a real understanding of that topic. Thus, the chapter on equations is followed by a review of percentage and interest from the point of view of the formula and simple equational relations. This treatment is particularly valuable for junior high school classes.

The book is open to criticism in that the first chapter on algebra dealing with algebraic numbers and symbols starts out with the study of positive and negative numbers. With the exception of one important consideration, the remaining chapters on algebra are excellent. Should not the psychological precede the logical? Then why should the pupil who is to learn rules in algebra, such as theorems for type forms of multiplication and factoring, be given the theorem at the start, followed by material to prove the theorem? Why not let the pupil here use his skill in "generalizing" which the authors call "algebraic study at its best"? It might also be suggested that the chapter on mensuration and experimental geometry, which precedes this work in algebra, could well be made to re-enforce the pupils' knowledge of the principles of deriving general laws. The chapter on geometry is headed "Mensuration—Lines and Angles." In the introductory paragraph it is stated that lines and angles are to be studied because they are the component parts of areas. The chapter includes work in construction, parallel lines, triangles, quadrilaterals, similar polygons, and areas of polygons. The difficulty with the material here seems to be that it passes too rapidly from one subject—and the many definitions given therewith—to another subject. For example, work is done in ratio and proportion so the pupil may understand the definition of similar polygons. This is followed, before passing into work in areas, by just two constructions—to construct a triangle similar to a given triangle and to draw a pair of similar triangles.

The problems of the book are in the main practical, furnishing opportunities for applying mathematical principles to situations of everyday life. The present writer believes the book will be of special interest to teachers of mathematics in junior high schools.

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